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ABSTRACT

Employment characteristics reported 30 months after graduation by over 1,000 respondents to the National Longitudinal Study of the High School Class of 1972 (NLS) were related to high school achievement on the Student Test Book of the NLS. Although respondents did not take a minimum competency test, experts agreed that the Student Test Book would correlate because it measured the same skills. Based on their Student Test Book percentile ranges, students were classified as having a low, marginal, or average probability of passing a minimum competency test. There was no significant relationship between the three passing classifications and the five employment characteristics under study: unemployment, occupational category, job steadiness during the previous year, income (combined if married), and job satisfaction. As expected, men dominated the labor and craft occupational categories; women dominated the clerical category. Income of single females was significantly lower than that of single males, especially when occupational category overlapped. Results implied that minimum competency testing has several limitations: it measures skills which are beneficial for independent living, but not essential for everyday survival; it ignores non-cognitive factors influencing employment, such as race, socioeconomic status, personality, school attendance; and it may incorrectly label students as incompetent because passing levels are inappropriate. (CP)

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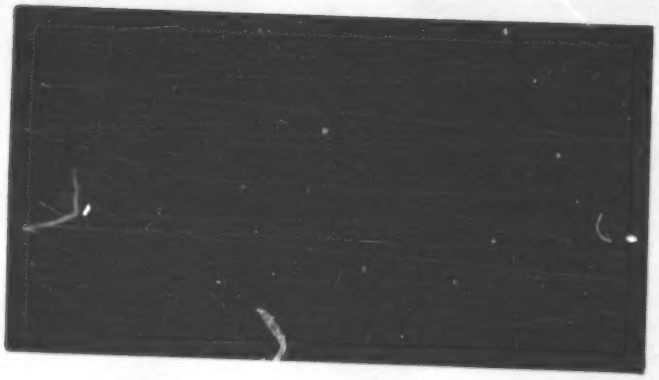

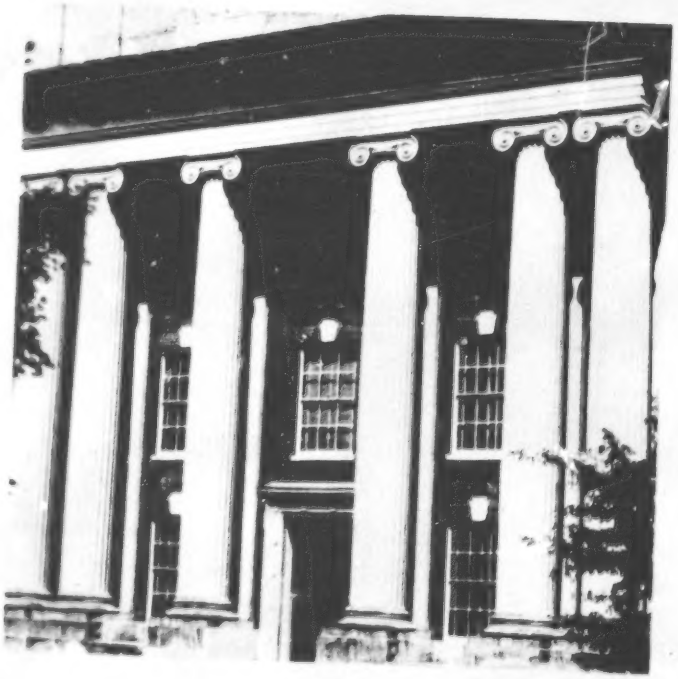

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The Relationship of High School Reading and Mathematics Achievement and Employment Experiences: Implications for Minimal Competency Testing

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Presented at the annual meeting of the National Council on Measurement in Education in Boston, Massachusetts, April 7 - April 11, 1980.

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The Relationship of High School Reading and Math Achievement And Employment Experiences: Implications for Minimal Competency Testing

Objectives of Inquiry

Concern for the quality of public education is growing in the United States. In the business and academic world, high school graduates' deficient performance has fostered skepticism as to the actual meaning of a high school diploma. The action more and more state legislatures have taken to assure diploma conferral to competent students has been the establishment of minimal competency testing (Pipho, 1978).

Though minimal competency testing seems to be part of the solution to the accountability problems, the testing programs themselves have difficulties to resolve. Determining the competency testing objectives and items, the testing approach, and the passing level has not been an easy task. Due to a lack of substantive evidence, these decisions were made rather arbitrarily (Glass, 1978b; Brown, 1978). To make these value judgments less arbitrary, as "less arbitrariness is safer " (Glass, 1978a), the decision makers need as much information as possible. Glass (1978a) suggested that to reduce this arbitrariness, data from comparative studies, norm-referenced tests, and longitudinal assessments of change would be useful.

As minimal competency testing programs basically began in only a few states in 1975 and 1976 (Pipho, 1978), it was not surprising that the literature review did not reveal any studies inspecting the post secondary school experiences of people who had failed minimal competency tests. The literature review also did not reveal any studies which examined the post secondary school life experiences of low achievement high school

graduates. No studies were identified which endeavored to determine whether there were any significant differences in the post-secondary school lives of "non-competent" or low achievement students and those students immediately above them in the achievement hierarchy who would have passed the competency tests. A competency test is supposed to measure and indicate competency to function in post-secondary school activities. To make less arbitrary decisions regarding the goals or rationale for minimal competency testing, as well as the passing level which will determine which students should fail the test due to their lack of skills necessary to function in society, educators would benefit from information regarding the relationship of reading and math functioning or achievement to post secondary school experiences. And herein lies the problem: decision makers lack this information.

Rather than attempt to determine a cut-off point for minimal competency tests, this study was designed to provide longitudinal data regarding the relationship of reading and math achievement to the employment experience variables of average and below average high school graduates. Only the life experiences of those average and below average achievement high school graduates were examined, as those with above average achievement should, by virtue of that achievement, not be of concern to minimal competency testing policy makers.

The major research question for this study was,

What is the relationship between high school reading and math achievement levels and employment experiences?

Recent legal controversies have proclaimed that schools are graduating students who have poor skills and are unable to qualify for jobs (Gilman, 1977). A purpose of minimal competency testing is to identify students who are illiterate and unable to function in society, and to deny them a high school diploma if remediation is unsuccessful in upgrading their skills to meet a predetermined level. As many school systems do not have sufficient funds for an adequate remedial program, educators are voicing the opinion that remediation in a year or two is impossible (Golden, 1977b; Feldman, 1977). Many low achievers will probably not receive diplomas. Denial of the diploma will deny these people the credentials now necessary for numerous jobs ("Jobs for Which," 1976). Before establishment of educational and legislative policies that may lead to this state of affairs, the relationship of high school reading and math achievement to employment experiences should be determined. With this information government officials and educators would have a wider knowledge base on which to determine competency testing rationale, policies, and procedures. Before people are deemed "incompetent" or "competent" to enter the world of work because of their performance on a competency test, it would be beneficial to have some knowledge of the relationship of reading and math variables to employment experiences.

Thus, the following research questions were addressed.

1. What is the relationship between high school reading and math achievement levels and later employment?
2. What is the relationship between high school reading and math achievement levels and occupational category?

3. What is the relationship between high school reading and math achievement levels and steadiness of employment?

4. What is the relationship between high school reading and math achievement levels and job satisfaction?

5. What is the relationship between high school reading and math achievement levels and income?

METHOD

Data Source

The data source for this study was the National Longitudinal Study of the High School Class of 1972 (NLS). The NLS was designed by the National Center for Educational Statistics to allow researchers to investigate the activities of young people after they leave high school, and to relate this information to prior educational and personal experiences (Levinsohn, Lewis, Riccobono, & Moore, 1976). The longitudinal design of the NLS permitted analyses of information over several years of the subjects' early adulthood lives.

Based upon several factors, the NLS was deemed appropriate for this study. First, the NLS was designed to provide extensive information about the employment variables of concern in this study. Second, since competency testing was rather a new testing program, life experience data were not available for those people who had taken competency tests. The NLS data base provided an excellent national sample from which to glean information about low achievement high school graduates. Third, the NLS sample was given the Student Test Book instrument which provided math and reading achievement levels. To ascertain whicher the Student Test Book achievement levels correlated with competency test achievement levels, several actions were taken.

First, Dr. Thomas Hilton, Senior Research Psychologist of Educational Testing Service, Princeton, New Jersey, was contacted by phone and questioned as to the correlation of the Student Test Book with the competency tests. ETS developed the Student Test Book for NLS (Levinsohn, et al., 1976) and has also developed a minimal competency test, Basic Skills Assessment ("ETS and Schools," 1977). Dr. Hilton stated that it was his opinion that the Student Test Book and the competency tests should be correlated and that the ordering of individuals on one would be very similar to the ordering of individuals on the other (Hilton, 1977).

Second, Dr. William Brown, Director of the Division of Research of the North Carolina Department of Public Instruction was consulted. He was contacted because during March 1978, North Carolina administered several minimal competency tests and the California Achievement Test to all the high school juniors enrolled in public schools in North Carolina. This procedure was part of the strategy North Carolina used to set up a minimal competency testing program and to determine an appropriate cut-off level (Brown, 1978). Correlation coefficients were calculated between the California Achievement Test which was used as the marker achievement test and each of the following competency tests: SHARP, ACT-Reading, ACT-Math, BSAP, TOPICS, and EVERYDAY. These correlations are reported in Table 1, "Correlation Coefficients for Competency Tests and the California Achievement Test." For example, the correlation between the SHARP and the CAT-Reading is .82. It was the opinion of Dr. Brown (1978) that the NLS Student Test Book reading and math subtests and the California Achievement Test should rank individuals in approximately the same order, and therefore, the

Table 1

Correlation Coefficients for Competency Tests and the California Achievement Test Taken in March 1978 by North Carolina High School Juniors[a]

Competency Tests	Correlation Coefficient
Reading	
SHARP	.82
ACT--Reading	.81
BSAP	.81
Mathematics	
TOPICS	.81
EVERYDAY	.90
ACT--Math	.79

[a]As part of its Pre-Competency Testing Program, during March 1978, the North Carolina State Department of Public Instruction gave juniors enrolled in the public high schools in North Carolina the competency tests and the CAT.

Note. From Gallagher, J., Chairman of the North Carolina Minimal Competency Test Commission. Mimeographed table, July, 1978.

correlations between the California Achievement TEst and the minimal competency tests should be similar to those which might be obtained between the Student Test Book and the minimal competency tests.

Not having the exact correlations between the STudent Test Book and the minimal competency tests was a limitation of the study. The researcher began the process of setting up procedures to determine the correlation between the Student Test Book and the minimal competency tests. However, since it was the opinion of both Dr. Hilton of ETS and Dr. Brown of the North Carolina Department of Public Instruction, that this procedure would be costly and unnecessary, it was not pursued. Both Hilton and Brown took the position that the nature of these tests was such that they would rank individuals in approximately the same order. Both the Student Test Book math subtest and the competency tests included the basic arithmetic procedures of addition, multiplication, subtraction and division, and excluded problems involving higher math as algebra and trigonometry. Both tests also contained word problems, graphs, and charts. The basic difference between the Student Test Book and the competency testing math sections was that the competency tests presented items in practical or "real-life" situation formats, whereas the Student Test Book questions were presented in a straight forward arithmetic problem format, i.e., 2 apples + 2 apples =___apples as opposed to 2 + 2 = ___. The reading sections of both tests involved reading comprehension and following directions. The minimal competency tests involved reading in a practical or "real-life" situation, i.e., a menu or consumer product label, whereas the Student

Test Book involved reading a short passage and responding to questions. Though using different formats, both tests required knowledge of basic reading and math skills. As a minimal competency test was not taken by the NLS subjects, the Student Test Book was used to determine the subjects' reading and math achievement level. The Student Test Book scores were the best data available retarding the subjects' reading and math skills.

Procedure

The available sample of the study included those subjects in the NLS sample who completed at least the Student Test Book. The Student Test Book was used to place the subjects into the achievement levels, and thus these scores were imperative. Based on the Research Triangle Institute's "NLS 1976 Release Tape Frequencies" (Levinsohn, et al., 1976), the study had an available sample of 15, 860 subjects.

The Student Test Book yielded reading and math scores. These scores determined the subjects' assignment to the levels in each of the independent variables: "reading achievement," "math achievement," and "readmath achievement." Readmath achievement was the average of the sum of the reading and math Student Test Book scores. As there was some discrepancy between those administering minimal competency tests as to whether or not the students who failed with reading or math, should be deemed "competent," the average of the reading and math scores, readmath, was also considered. Under consideration was whether or not the predictive capability of a composite of reading and math

competency was any greater than the predictive ability of either reading or math competency alone.

Reading, math, and readmath achievement each had three classification levels: "low achievement level," "marginal achievement level," and "average achievement level." The low achievement level was made up of those students who, if they had been given a competency test in high school, would probably not have passed the test. The marginal achievement level was made up of those subjects who, if they had been given a competency test in high school, would probably have narrowly passed the test. The average achievement level was made up of those students who, had they taken a competency test in high school, would probably have passed. The selection of the parameters for these levels was based, in part, upon minimal competency testing results and expectations, and other basic skills research. Briefly, these were the following. The National Assessment of Educational Progress reported that 21% of students in disadvantaged urban areas could not read, and 20% of those from the Southeast could not perform everyday reading tasks ("The Costs of," 1977). When the program of competency testing began in the Denver school district, 15% of the students failed to pass the test before they completed the twelfth grade ("Learning to Read," 1978). In Florida, the failure rate was 11% for communication skills, and 40% for computational skills (Golden, 1977a, 1C). Those educators concerned with competency testing often speculate that 15% to 20% of the students who take minimal competency tests could be predicted to fail (Cawelti, 1977; Brown, 1978; Brickell, 1978).

The first level or the low achievement level for each of the achievement variables consisted of those subjects whose scores fell within 0 to 15th percentiles on the Student Test Book. Selecting those in the 15th or lower percentile allowed some confidence that those scoring within this range would more probably have failed a minimal competency test in high school (Brown, 1978; Gallagher, 1978).

The second level or marginal achievement level for each achievement variable consisted of those subjects whose scores on the Student Test Book fell within the 20th to 25th percentiles. A percentile range of five points was left between the achievement levels to allow for maximizing differences and to reduce the chances of misclassification. This is an acceptable procedure when testing for differences (Welsh, 1975). Based on minimal competency testing results and expectations, those in the 20th to 25th percentiles would probably have narrowly passed a minimal competency test in high school.

The third level or average achievement level for each of the achievement levels consisted of those subjects whose Student Test Book scores fell within the 42nd to 57th percentiles. A percentile range was again left between the levels to allow for maximizing differences and to reduce the chances of misclassification.

Two random samples were drawn from the NLS data. The second sample allowed for an immediate replications of the analyses. Each random sample consisted of 25% of the original sample.

For each of the five research questions, the appropriate data from the NLS Second Follow-Up Questionnaire, which included information regarding the time period of 30 months after high school, was utilized.

Analyses, Results, and Discussion

In this section, the variables for each question are defined and the results of the analyses presented.[1] The sexes are analyzed separately as though women's roles are changing, occupational expectations continue to differ for men and women (Hanaway & Astin, 1977).

1. What is the relationship between high school reading and math achievement levels and later employment?

"Employment" was inferred from the report of the subject that he or she had "a" job, though not necessarily a "good" job. Subjects were asked if they had been employed during the time period of 30 months after high school. To assess the relationship between high school reading and math achievement levels and later employment, the frequency and percentage of subjects for each achievement level who were employed and unemployed were calculated, as well as chi-square. The results of the crosstabulation of employment by reading, math and readmath achievement levels for males and females are presented in Tables 2 and 3. The results for this question indicated that there was little association between high school reading, math, or readmath achievement and employment. Employment status cannot be predicted with any certainty from a high school graduate's reading math, or readmath achievement level. It is striking that for each achievement variable, a greater percentage of males than females were employed. In most cases, there was a difference of 15 to 20 percentage points.

2. What is the relationship between high school reading and math achievement levels and occupational category?

An "occupational category" is the classification into which a per-

[1] Due to the large number of analyses, the results are presented in summary form. For the complete figures, please consult Furr (1979).

Table 2

Crosstabulation of Male Subjects' Employment Status 30 Months After High School by Reading, Math, and Readmath Achievement Levels

Employment Status	Reading Achievement Levels			Math Achievement Levels			Readmath Achievement Levels		
	Low	Marginal	Average	Low	Marginal	Average	Low	Marginal	Average
Sample 1									
Employed	283[1]	78	219	218	79	162	223	49	203
	82.7[2]	78.0	78.5	82.0	84.0	77.1	82.9	73.1	79.0
Unemployed	59	22	60	48	15	48	46	18	54
	17.3	22.0	21.5	18.0	16.0	22.9	17.1	26.9	21.0
Totals	342	100	279	266	94	210	269	67	257
	47.4	13.9	38.7	46.7	16.5	36.8	45.4	11.3	43.3
	χ^2=2.20, 2 d.f., ρ=.331			χ^2=2.62, 2 d.f., ρ=.269			χ^2=3.56, 2 d.f., ρ=0.16		
Sample 2									
Employed	264	110	229	221	86	187	215	57	223
	83.3	86.6	75.6	81.9	91.5	81.0	85.0	78.1	79.4
Unemployed	53	17	74	49	8	44	38	16	58
	16.7	13.4	24.4	18.1	8.5	19.0	15.0	21.9	20.6
Totals	317	127	303	270	94	231	253	73	281
	42.4	17.0	40.6	45.4	15.8	38.8	41.7	12.0	20.6
	χ^2=9.32, 2 d.f., ρ=.009			χ^2=5.74, 2 d.f., ρ=.056			χ^2=3.45, 2 d.f., ρ=.177		

[1]Frequency of those employed or unemployed for the achievement level.
[2]Percentage of those employed or unemployed for the achievement level.

Table 3
Crosstabulation of Female Subjects' Employment Status 30 Months After High School by Reading, Math, and Readmath Achievement Levels

Employment Status	Reading Achievement Levels			Math Achievement Levels			Readmath Achievement Levels		
	Low	Marginal	Average	Low	Marginal	Average	Low	Marginal	Average
Sample 1									
Employed	191[1]	80	187	229	73	150	190	72	177
	60.4[2]	68.4	60.5	63.1	64.0	67.3	61.9	72.7	63.2
Unemployed	125	37	122	134	41	73	117	27	103
	39.6	31.6	39.5	36.9	36.0	32.7	38.1	27.3	36.8
Totals	316	117	309	363	114	223	307	99	280
	42.6	15.8	41.6	51.9	16.3	31.9	44.8	14.4	40.8
	χ^2=2.60, 2 d.f., ρ=.272			χ^2=1.07, 2 d.f., ρ=.585			χ^2=3.94, 2 d.f., ρ=.139		
Sample 2									
Employed	176	71	200	231	81	151	183	72	184
	58.3	57.3	67.6	62.1	69.2	61.9	59.8	75.0	65.9
Unemployed	126	53	96	141	36	93	123	24	95
	41.7	42.7	32.4	37.9	30.8	38.1	40.2	25.0	34.1
Totals	302	124	296	372	117	244	306	96	279
	41.8	17.2	41.0	50.8	16.0	33.3	44.9	14.1	41.0
	χ^2=6.84, 2 d.f., ρ=.032			χ^2=2.20, 2 d.f., ρ=.332			χ^2=7.82, 2 d.f., ρ=.020		

[1]Frequency of those employed or unemployed for the achievement level.
[2]Percentage of those employed or unemployed for the achievement level.

son's job would fall on the United States' Census. Occupational category was defined as a result of information provided from the subject's description of (a) name of his employer; (b) the kind of business this was; (c) the kind of job or occupation he or she held in this business or industry; (d) the major duties of this position. These four responses were used by NCES to identify the appropriate occupational category in the "1970 Census of Population-Occupational Classification System." The classification system had twelve main categories: professional; managers and administrators except farm; technical and kindred workers; sales workers; clerical and kindred workers; craftsmen and kindred workers; operatives, except transport; laborers, except farm; farmers and farm managers; transport workers; service workers; and private household workers.

To assess the relationship between high school reading and math achievement levels and occupational category, frequencies and percentages of subjects were calculated for each occupational category by reading, math, and readmath achievement levels. The results of the crosstabulation of occupational category by reading, math, and readmath achievement levels for males and females are presented in Tables 4 and 5. The results for this question indicated that there was little relationship between high school reading, math, and readmath achievement levels and occupational categories. There were some differences found between the achievement levels within particular crosstabulations; however, these findings were not consistent, and thus cannot be considered reliable.

It is clear that males and females differed with regard to

Percentage of Subjects in Each Occupational Category, as Defined by the 1970 U.S. Census, 30 Months After High School by Reading, Math, and Readmath Achievement Levels for Males

Occupational Category	Reading Achievement Levels			Math Achievement Levels			Readmath Achievement Levels		
	Low	Marginal	Avg.	Low	Marginal	Avg.	Low	Marginal	Avg.
Sample 1									
Professional	3.3[2]	1.8	6.4	2.5	3.4	6.5	2.9	0.0	6.5
Manager-Adm.	5.1	7.3	4.3	1.9	5.2	4.3	3.5	5.9	4.3
Sales	0.0	0.0	1.4	0.0	0.0	1.1	0.0	0.0	1.4
Clerical	7.0	12.7	11.3	8.2	8.6	5.4	5.9	20.6	12.3
Craftsman	23.7	25.5	27.7	24.1	24.1	33.7	21.1	32.4	28.3
Operative	27.9	30.9	18.4	25.3	24.1	20.7	31.0	14.7	13.8
Transport	7.9	3.6	5.0	10.8	1.7	3.3	8.8	2.9	8.7
Laborer	15.8	10.9	16.3	19.0	19.0	16.3	18.7	14.7	18.1
Farmer	0.5	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.7
Farm Labor	0.5	5.5	1.4	0.6	0.0	1.1	0.6	2.9	1.4
Service Wk.	7.9	1.8	7.8	7.6	13.8	5.4	7.6	5.9	4.3
Private Hse.	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sample 2									
Professional	2.5	6.2	8.4	0.6	6.5	7.3	1.2	7.1	7.5
Manager-Adm.	3.0	4.9	6.1	1.9	1.6	4.8	1.9	0.0	6.1
Sales	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Clerical	10.4	11.1	9.2	12.2	0.6	12.9	10.5	7.1	8.8
Craftsman	20.4	16.0	29.8	16.0	40.3	22.6	19.1	31.0	29.3
Operative	27.9	28.4	19.1	26.3	17.7	24.2	30.9	14.3	21.1
Transport	8.0	7.4	3.8	11.5	4.8	4.0	8.6	14.3	2.7
Laborer	21.9	17.3	14.5	23.1	21.0	16.9	22.2	19.0	16.3
Farmer	0.0	1.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Farm Labor	1.5	3.7	1.5	2.6	0.0	1.6	1.9	4.8	2.0
Service Wk.	4.0	3.7	6.9	5.1	6.5	5.6	3.7	2.4	6.1
Private Hse.	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[1]An "Occupational category" is the classification into which a person's job would fall on the United States' Census. The "1970 Census of Population-Occupational Classification System" was used by the NLS to classify the subjects. A copy of the classification system appears in Levinsohn, et al., 1976.

[2]Percentage of subjects.

Table 5

Percentage of Subjects in Each Occupational Category, as Defined by the 1970 U.S. Census, 30 Months After High School by Reading, Math, and Readmath Achievement Levels for Females

Occupational Category	Reading Achievement Levels			Math Achievement Levels			Readmath Achievement Levels		
	Low	Marginal	Avg.	Low	Marginal	Avg.	Low	Marginal	Avg.
Sample 1									
Professional	2.8[2]	1.9	5.8	4.0	6.1	7.8	2.8	0.0	7.8
Manager-Adm.	0.0	0.0	2.9	0.0	2.0	3.9	0.0	2.0	2.8
Sales	0.0	1.9	0.7	0.6	2.0	1.9	0.7	0.0	0.8
Clerical	51.1	51.9	59.7	48.3	65.3	56.3	47.6	76.0	53.9
Craftsman	3,5	3.8	0.7	2.9	4.1	1.0	3.4	0.0	3.9
Operative	17.7	11.5	10.1	16.7	6.1	9.7	18.6	6.0	10.9
Transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Laborer	2.1	3.8	2.2	2.9	0.0	1.0	2.1	0.0	0.0
Farmer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Farm Labor	0.7	0.0	0.0	0.6	0.0	0.0	0.7	0.0	0.0
Service Wk.	20.6	25.0	18.0	23.6	14.3	18.4	23.4	14.0	21.9
Private Hse.	1.4	0.0	0.0	0.6	0.0	0.0	0.7	2.0	0.0
Sample 2									
Professional	3.0	3.7	5.2	3.8	9.6	3.7	3.3	1.9	5.6
Manager-Adm.	3.7	3.7	3.8	3.3	5.8	3.7	4.0	1.9	4.0
Sales	0.7	0.0	0.8	1.1	0.0	0.9	0.7	0.0	0.8
Clerical	44.0	63.0	55.0	42.4	57.7	57.9	42.7	53.7	57.6
Craftsman	3.0	1.9	1.5	3.3	1.9	3.7	4.0	5.6	2.4
Operative	20.1	9.3	10.0	17.9	13.5	9.3	20.0	20.4	8.0
Transport	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0
Laborer	5.2	3.7	3.1	5.4	3.8	0.0	4.7	1.9	1.6
Farmer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Farm Labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Service Wk.	20.1	14.8	18.5	22.3	7.7	20.6	20.7	14.8	20.0
Private Hse.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[1] An "Occupational category" is the classification into which a person's job would fall on the United States' Census. The "1970 Census of Population-Occupational Classification System" was used by the NLS to classify the subjects. A copy of the classification system appears in Levinsohn, et al., 1976.

[2] Percentage of subjects.

occupational categories. Concentrations of both sexes were found in the categories of "clerical," "operative," and "service workers;" however, concentrations of males were also found in the more manually oriented occupational categories of "laborers" and "craftsman." Also, at least forty percent or more of the females for each achievement level were in the "clerical" category. As clerical work is traditionally thought of as a "female" dominated occupation, this was not a surprising finding.

3. What is the relationship between high school reading and math achievement levels and steadiness of employment?

"Steadiness of employment" was defined as (a) the number of weeks worked during the 12 month period, and (b) the number of weeks not worked or unemployed during the 12 month period. Subjects were asked the number of weeks they had been employed and unemployed during the 12 month period from 18 months to 30 months after high school.

To assess the relationship between high school reading and math achievement levels and steadiness of employment, analysis of variance was used. The results of the analyses of steadiness of employment by reading, math, and readmath achievement levels for males and females are presented in Tables 6 through 9. The results indicated a very weak relationship between high school reading and math achievement levels and steadiness of employment. Though some significant differences were found between the achievement levels, these significant differences were not consistently replicated by the other sample. Also the eta squared associated with the analyses of variance indicated a weak to almost non-exsitent association between

Table 6

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Number of Weeks Worked 18 to 30 Months After High School by Achievement Levels for Males

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	44.7	42.0	39.6	8.177*	.02
Math	42.7	46.1	41.6	2.861*	.01
Readmath	44.3	42.6	40.5	3.868*	.01
		Sample 2			
Reading	44.3	42.3	39.3	7.73*	.02
Math	41.0	46.8	43.6	5.031*	.02
Readmath	39.4	38.8	36.5	1.859	.00

*F-ratio was significant, $p<.05$.

Table 7

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Number of Weeks Not Worked 18 to 30 Months After High School by Achievement Levels for Males

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	2.8	2.7	3.0	0.13	.00
Math	3.6	2.9	2.6	1.11	.00
Readmath	3.6	2.5	2.6	1.41	.00
		Sample 2			
Reading	2.5	2.6	2.8	0.11	.00
Math	3.5	2.4	2.3	1.90	.00
Readmath	3.3	2.2	2.8	0.15	.00

*F-ratio was significant, $p<.05$.

Table 8

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Number of Weeks Worked 18 to 30 Months After High School by Achievement Levels for Females

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	r^2
		Sample 1			
Reading	39.2	38.2	38.1	0.250	.00
Math	39.8	38.8	39.6	0.127	.00
Readmath	28.6	32.6	30.3	1.760	.00
		Sample 2			
Reading	39.5	36.9	38.2	0.905	.00
Math	40.2	39.1	38.7	0.564	.00
Readmath	28.3	27.3	30.2	1.070	.00

[a]F-ratio was significant, $p<.05$.

Table 9

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Number of Weeks Not Worked 18 to 30 Months After High School by Achievement Levels for Females

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	r^2
		Sample 1			
Reading	2.8	3.2	2.9	0.070	.00
Math	3.3	3.2	2.0	1.920	.00
Readmath	3.1	2.6	3.7	0.768	.00
		Sample 2			
Reading	3.6	1.9	2.4	2.500	.01
Math	2.9	3.6	2.4	1.000	.00
Readmath	3.2	2.4	2.6	0.503	.00

[a]F-ratio was significant, $p<.05$.

the variables. Though in many of the analyses, the low achievement level subjects were employed a greater number of weeks and also unemployed a greater number of weeks than the marginal or average achievement levels' subjects, no reliable statements may be made regarding the differences between the achievment levels due to the weak statistical findings.

4. What is the relationship between high school reading and math achievement levels and job satisfaction?

"Job satisfaction" was determined by asking the subjects to respond to a series of statements on the NLS questionnaires pertaining to aspects of their jobs, i.e., pay and fringe benefits, working conditions, security and permanence. A four point scale was used with "1" indicating "very satisfied," and "4" indicating "very dissatisfied." A summated rating scale was constructed using the job satisfaction statements.

To assess the relationship between high school reading and math achievement levels and job satisfaction, analysis of variance was used. The results of the analyses of job satisfaction 30 months after high school by reading, math, and readmath achievement levels for males and females are presented in Tables 10 and 11. The results of the analyses for this question indicated that there is almost no relationship between high school reading, math, and read math achievement and job satisfaction. Also no differences in job satisfaction were noted between males and females.

Table 10

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Job Satisfaction[1] 30 Months After High School by Achievement Levels for Males

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	11.1	11.6	12.8	3.230*	.01
Math	12.0	12.5	12.8	0.546	.00
Readmath	11.5	11.3	12.7	1.538	.00
		Sample 2			
Reading	12.3	11.9	12.7	0.528	.00
Math	12.4	12.6	12.7	0.109	.00
Readmath	12.6	11.2	12.0	1.055	.00

*F-ratio was significant, $p<.05$.

[1]"Job satisfaction" was determined by asking the subjects to respond to a series of statements pertaining to aspects of their jobs. A four point scale was used with "1" indicating "very satisfied" and "4" indicating "very dissatisfied." Summated rating scales were constructed using the job satisfaction statements in the NLS Questionnaires. A score of "11" indicates complete satisfaction, a score of "44" indicates complete dissatisfaction.

Table 11

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Job Satisfaction[1] 30 Months After High School by Achievement Levels for Females

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	11.9	11.0	12.0	1.312	.00
Math	11.6	11.8	11.9	0.066	.00
Readmath	11.2	12.7	11.3	1.367	.00
		Sample 2			
Reading	11.5	11.8	12.0	0.285	.00
Math	12.4	11.4	12.0	0.618	.00
Readmath	12.1	11.3	11.7	2.205	.01

*F-ratio was significant, $p<.05$.

[1]"Job satisfaction" was determined by asking the subjects to respond to a series of statements pertaining to aspects of their jobs. A four point scale was used with "1" indicating "very satisfied" and "4" indicating "very dissatisfied." Summated rating scales were constructed using the job satisfaction statements in the NLS Questionnaires. A score of "11" indicates complete satisfaction, a score of "44" indicates complete dissatisfaction.

5. What is the relationship between high school reading and math achievement levels and yearly income?

"Yearly income" was measured by asking the subjects to specify their total incomes and their spouses' total incomes. For the analyses, the subjects were divided into two marital status categories: single and married. The analyzed income of those in the "single" marital status category was the amount the subject reported as his or her "total income." The analyzed income of those in the "married" marital status category was the sum of the subject's plus his or her spouse's reported "total income." The "combined" income was used in the analyses as this was the income to which the subject had access.

To assess the relationship between high school reading and math achievement levels and yearly income, analysis of variance and eta squared were used. The results of the analyses of yearly income by reading, math, and readmath achievement levels for males and females are presented in Tables 12 through 15. The results of this question indicate little relationship between high school reading and math achievement and yearly income. Though some significant differences were found in the yearly income means, these were not consistently replicated by the second sample. Also, the eta squareds indicated very little relationship between high school reading and math levels and yearly income.

It is notable that regardless of achievement level, single females consistently had lower income means than single males. This is especially noteworthy in that the occupational categories into which the males' and females' positions fell, overlapped considerably. It was also noted that there was not a difference between married

Table 12

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Single Subjects' Income 30 Months After High School by Achievement Levels for Males

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	4893[1]	4577	3941	4.341*	.01
Math	4404	5491	4153	3.650*	.01
Readmath	4834	5058	4364	1.140	.00
		Sample 2			
Reading	4879	5237	4198	3.750*	.01
Math	4264	5510	4680	3.140*	.01
Readmath	4796	4548	4461	0.426	.00

*F-ratio was significant, $p<.05$.

[1]Income was rounded off to the nearest dollar.

Table 13

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Single Subjects' Income 30 Months After High School by Achievement Levels for Females

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	3098[1]	3240	3090	0.067	.00
Math	3042	3197	3218	0.165	.00
Readmath	2932	3772	3329	1.760	.01
		Sample 2			
Reading	2556	2617	3043	1.671	.01
Math	2729	2691	3343	2.380	.01
Readmath	2570	2456	3046	1.910	.01

*F-ratio was significant, $p<.05$.

[1]Income was rounded off to the nearest dollar.

Table 14

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Married Subjects' Income[1] 30 Months After High School by Achievement Levels for Males

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	9710[2]	9064	8996	0.407	.00
Math	9273	10667	9469	0.628	.01
Readmath	9528	9435	9407	0.009	.00
		Sample 2			
Reading	9413	9042	9729	0.179	.00
Math	9289	10994	9425	0.787	.01
Readmath	9042	8962	10034	0.748	.01

*F-ratio was significant, $p<.05$.

[1]Married Subjects' income included the subjects' income plus their spouses' income.

[2]Income was rounded off to the nearest dollar.

Table 15

Reading, Math, and Readmath Achievement Level Means and Analyses of Variance: Married Subjects' Income[1] 30 Months After High School by Achievement Levels for Females

Achievement Variable	Low Level Mean	Marginal Level Mean	Average Level Mean	F	η^2
		Sample 1			
Reading	8356[2]	9403	9743	1.859	.02
Math	8565	9741	9601	1.270	.01
Readmath	7711	10136	9510	4.900*	.05
		Sample 2			
Reading	8426	7647	10589	7.380*	.00
Math	9292	8627	9636	0.488	.00
Readmath	8328	10106	10481	4.150*	.04

*F-ratio was significant, $p<.05$.

[1]Married Subjects' income included the subjects' income plus their spouses' income.

[2]Income was rounded off to the nearest dollar.

males' and females' yearly incomes. As the yearly incomes of these subjects consisted of both the subjects' income and their spouses' incomes, this combining may have evened out the differences between the sexes' incomes which were apparent for the single subjects.

Implications and Recommendations

If, in fact, high school reading and math achievement are strongly related to the average and below average subjects' employment experiences, this study failed to reveal that relationship. Little association was exhibited between the high school reading and math achievement levels and the employment variables. The strength of association between the employment variables and the reading and math achievement levels was very weak.

The lack of a relationship might be due to the short time period between high school graduation and the time of the Second Follow-Up Survey of the NLS: 30 months after high school. Some literature suggested that young people tend to "drift" or have several intermediary jobs before they enter career related activities. Also some of the employment variables may have been too broad, i.e., occupational category. Occupational category only involved 12 catetories in which many jobs of varying skills were in each category. A more discriminating organization might have revealed a greater relationship between occupation and achievement. Further considering only the average and below average reading and math achieving subjects reduced the range in the samples, and thus may

have reduced the variance in the sample. This reduction in variance may help to account for the lack of relationship found between the reading and math achievement levels and the life experience variables. Minimal competency testing programs are only concerned with the lower skilled student and thus, to gain information regarding varying levels within this group, only average and below average achievers were studied.

This study provided information regarding the group of subjects with which the minimal competency testing movement is most concerned, average and below average achievers. The results indicated little relationship between reading and math achievement levels and employment variables. The areas which minimal competency tests examine may have little relationship to peoples' activities when they leave high school.

The indication of little relationship between high school reading and math achievement levels had several implications for those making decisions regarding minimal competency testing programs. First, the lack of relationship found between reading and math achievement levels and life experience variables suggested that it might be wise to reexamine the rationale for minimal competency testing: to assure that high school graduates have the skills necessary to survive or to function successfully in modern society. For example, employment status had an extremely weak relationship to the reading and math achievement levels. The achievement levels' subjects did not differ substantially in their employment status, that is, having "a" job. Employment merely indicated having "a" job, as opposed to having a "good" job. Certainly, it would appear that reading and computational skills should be related to obtaining employment; however, the results

of this study did not support that premise. Perhaps this was because those who were unable to read and compute were able to ask others to complete the reading and math tasks for them, i.e., filling out the job application forms. Further to find a job, it does not appear to be necessary to be able to read the newspaper, for example, because television, radio, and job placement services may fill part of the void. A person would certainly be more independent, however, if he/she was able to glean information from written material without another's aid. Hence, rather than the terminology "skills for 'survival," as a rationale for minimal competency testing, the minimal competency testing programs might term these skills, "beneficial for 'independent' living."

Second, perhaps other factors which minimal competency testing does not consider control part of the variance in the life experiences studied. Often cited in the literature as influencing employment and educational activities are socioeconomic status, race, family background, peer relationships and personality factors. Additionally, it is possible that schooling's contributions to successful functioning in society also included the intangible teaching of the schools' curricula: dependability, responsibility, acceptance of authority, cooperation with others, and regular attendance. These were traits which employers frequently stressed in hiring and retaining personnel. Moreover, high school drop-outs had greater disciplinary problems in the military and greater difficulty in working with others in on-the-job training than high school graduates. The National Association of Secondary School Principals also stated that these were

important components of the public school experience.

A review of the minimal competency testing literature indicated that some educators anticipated a 15 to 20% failure rate for the current minimal competency testing programs. The results of the present study implied that a norm-referenced minimal competency test, which sets the failure rate between 15 or 20% may yield a failure group whose post secondary life activities do not differ substantially from the life activities of the low scorers in the passing group. Also, a criterion-referenced minimal competency test's criterion level, which yields a 15 to 20% failure rate, may produce a similar dilemma. Does this mean that the passing levels should be lower or higher? Should young people be labeled "incompetent" when others with similar reading and math skills are currently functioning in society as well as those with somewhat greater reading and math skills? This study has indicated that math and reading skills may bear little relationship to post secondary life activities. Before students are deemed incompetent to function in society because of poor reading and math skills more research should be conducted to determine an appropriate passing level for minimal competency tests.

Some educators have expressed the opinion that standards of scholarship may be set for graduation, regardless of their relationship to post secondary life activities. Scholarly excellence may be promoted without necessarily having a strong relationship to later activities. Preparation for the world of work is but one of schooling's purposes; schooling also provides man with knowledge and skills for other life activities and experiences. Rather than using

"survival" as part of the rationale for minimal competency testing, educators might simply state that, to obtain a high school diploma, demonstration of the possession of certain minimal skills would be required. This system would be similar to that of graduate college programs which require qualifying comprehensive exams following the completion of the required courses.

The high school diploma would represent several factors: attendance in school for 12 years; reading and computational skills; knowledge in academic and leisure areas; and adherence to standards and rules. If a person was deficient in any of these areas, then the high school diploma would be denied. Indeed, if employers are more concerned with the traits a person may possess because he has had the perseverence to sit through 12 years of schooling, then perhaps the "attendance" diploma would suffice. Of course, for such to become a reality, employers would need to re-examine their hiring practices and requirements for positions. Are reading and math skills necessary to complete the tasks of the position? Indeed, the results of this study indicated that perhaps employers should analyze the requirements of the positions and determine exactly what skills are necessary for the employees to perform the tasks of their jobs.

This study found that the relationship between reading and math achievement levels and several life experience variables was extremely weak. Several reasons have been offered for this finding as well as implications and recommendations for the minimal competency testing programs. This study certainly indicated that further research is necessary in the area of basic skills to set the appropriate minimal

competency objectives and passing levels. Without further research, young people may be labeled "incompetent" on the basis of the examination of tasks which bear little relationship to life experiences.

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